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Attorney Docket No. 0756-2358

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:

Shunpei YAMAZAKI

Serial No. 09/939,767

Filed: August 28, 2001

For: SEMICONDUCTOR DEVICE AND
METHOD OF FABRICATING SAME

) Group Art Unit: 2813

) Examiner: D. Hogans

) CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as First Class Mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on

9-11-03

Rose M. O'Connell

RESPONSE

Honorable Commissioner of Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

The Official Action mailed June 11, 2003, has been received and its contents carefully noted. This response is filed within three months of the mailing date of the Official Action and therefore is believed to be timely without extension of time. Accordingly, the Applicant respectfully submits that this response is being timely filed.

The Applicants note with appreciation the consideration of the Information Disclosure Statement filed on August 28, 2001.

Claims 1-3, 5-7 and 35-61 are pending, of which claims 1, 35, 42, 47, 54, 58 are independent.

Paragraph 2 of the Official Action rejects claims 1-3, 5-7, 42-46 and 54-61 as obvious based on the combination of U.S. Patent No. 5,550,070 to Funai et al. and U.S. Patent No. 5,459,090 to Yamazaki et al., and claims 35-41 and 47-53 based on the combination of Funai, Yamazaki '090 and U.S. Patent No. 5,764,321 to Koyama et al. The Applicant respectfully traverses the rejection because the Official Action has not made a *prima facie* case of obviousness.

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As stated in MPEP §§ 2142-2143.01, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." In re Kotzab, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

The prior art, either alone or in combination, does not teach or suggest all the features of the independent claims. With respect to independent claims 1, 35 and 54, Funai and Yamazaki '090 do not teach or suggest a concentration of said crystallization promoting material in a source region and a drain region formed in said active layer is higher than a concentration of said crystallization promoting material in other regions in said active layer by two or more orders of magnitude. With respect to independent claims 42, 47 and 58, Funai and Yamazaki '090 do not teach or suggest a concentration of said crystallization promoting material in a source region and a drain region formed in said active layer is higher than a concentration of said crystallization promoting material in other regions in said active layer which is less than 5×10^{16} atoms/cm³.

Funai appears to disclose a source and drain regions 116, 117, a part of which may include high-concentration nickel regions 107, 109 (see Figs. 5-11). Further, Funai

discloses that a concentration of nickel in the source and drain regions 116, 117, except for regions 107, 109, is the same as a concentration of nickel in other regions in an active layer, i.e. there appears to be a concentration of nickel throughout crystalline silicon film 112, which includes source and drain regions 116, 117 and channel region 118 (see Figs. 10 and 11; col. 9, lines 6-63). Still further, it is clear that regions 107, 109 of Funai are small in comparison to the total size of the source region 116 and the drain region 117 (see Figs. 10 and 11). Therefore, it simply does not follow that Funai teaches or suggests that a concentration of a crystallization promoting material in source and drain regions 116, 117 formed in said active layer is higher than a concentration of said crystallization promoting material in other regions in said active layer, i.e. channel region 118, particularly by two or more orders of magnitude or which is less than 5×10^{16} atoms/cm³. At best, Funai teaches that regions 107, 109 have a concentration of nickel which is high compared to the rest of the source and drain regions 116, 117, but which is not necessarily higher than channel region 118. Despite the assertion to the contrary in the Official Action, it would not have been obvious to one of ordinary skill in the art at the time of the invention to modify Funai such that source and drain regions 116, 117 would have the same concentration as the high concentration regions 107, 109, and that the concentration in regions 116, 117 would be higher than region 118 by two or more orders of magnitude, or that the concentration of region 118 would be less than 5×10^{16} atoms/cm³.

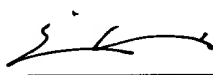
Yamazaki '090 and Koyama do not cure the deficiencies in Funai. The Official Action relies on Yamazaki '090 to allegedly teach "a gate electrode comprising tantalum" (page 3, Paper No. 9), and on Koyama to allegedly teach "a laminate structure (311) of silicon nitride and polyimide" (page 7, Id.). Funai, Yamazaki '090 and Koyama, either alone or in combination, do not teach or suggest a concentration of said crystallization promoting material in a source region and a drain region formed in said active layer is higher than a concentration of said crystallization promoting material in other regions in said active layer by two or more orders of magnitude; or a concentration

of said crystallization promoting material in a source region and a drain region formed in said active layer is higher than a concentration of said crystallization promoting material in other regions in said active layer which is less than 5×10^{16} atoms/cm³.

Since Funai and Yamazaki '090 do not teach or suggest all the claim limitations, a *prima facie* case of obviousness cannot be maintained. Accordingly, reconsideration and withdrawal of the rejection under 35 U.S.C. § 103(a) are in order and respectfully requested.

Should the Examiner believe that anything further would be desirable to place this application in better condition for allowance, the Examiner is invited to contact the Applicant's undersigned attorney at the telephone number listed below.

Respectfully submitted,



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